



URBAN FORESTRY RESEARCH & TECHNOLOGY TRANSFER:

A NEEDS ASSESSMENT FOR THE PACIFIC NORTHWEST REGION

JANUARY 2008

PROJECT SPONSORS:

**COLLEGE OF FOREST RESOURCES
UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON**

**PACIFIC NORTHWEST RESEARCH STATION
U.S. FOREST SERVICE
PORTLAND, OREGON**

University of Washington

College of Forest Resources



THIS PAGE INTENTIONALLY LEFT BLANK

URBAN FORESTRY RESEARCH & TECHNOLOGY TRANSFER:

A NEEDS ASSESSMENT FOR THE PACIFIC NORTHWEST REGION

PROJECT SPONSORS:

**COLLEGE OF FOREST RESOURCES
UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON**

**PACIFIC NORTHWEST RESEARCH STATION
U.S. FOREST SERVICE
PORTLAND, OREGON**

JANUARY 2008

PREPARED BY:

**Kathleen L. Wolf, Ph.D.
College of Forest Resources
University of Washington
Box 352100
Seattle, WA 98195
206.780.3619
kwolf@u.washington.edu**

**Linda E. Kruger, Ph.D.
Social Science Team Leader
PNW Research Station, US Forest Service
2770 Sherwood Lane, Suite 2A
Juneau, Alaska 99801-8545
907.586.8811 x 228
lkruger@fs.fed.us**

THIS PAGE INTENTIONALLY LEFT BLANK

URBAN FORESTRY RESEARCH & TECHNOLOGY TRANSFER:

A NEEDS ASSESSMENT FOR THE PACIFIC NORTHWEST REGION

ABSTRACT

This project was a process of discovery to explore and understand urban forestry research and technology transfer needs in the Pacific Northwest (PNW) region using a stakeholder participatory process. A two phase, abbreviated Delphi process was conducted, inviting input from urban forestry professionals, academics, and agency-based managers. Research issues were first identified, then prioritized, within these themes: urban forest resource, resource management, and human dimensions. The resulting information is summarized here to provide an urban forestry research framework that can potentially guide science and funding efforts at regional and national levels. Results concerning outreach messages and audiences can be used to guide urban forestry technology transfer in the Pacific Northwest.

KEY WORDS: urban forestry, research, needs assessment, technology transfer, Pacific Northwest

ACKNOWLEDGEMENTS

The authors wish to thank the many urban forestry professionals and scholars of the Pacific Northwest region who took time out of their busy schedules to participate in a Delphi process. Stakeholders were considered and chosen to represent the breadth of issues and needs for urban forestry research across cities large and small, in education, and concerning public policy. Correspondence should be addressed to kwolf@u.washington.edu Additional information can be found at: www.cfr.washington.edu/research.envmind

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

| | |
|---|-----------|
| Abstract | i |
| Acknowledgements | i |
| Table of Contents | ii |
| Executive Summary | 1 |
| Project Purpose..... | 1 |
| Approach..... | 1 |
| What Did We Learn?..... | 1 |
| Next Steps? | 2 |
| 1. Introduction | 3 |
| 2. Background | 4 |
| Delphi Themes – Urban Forest Sustainability | 4 |
| Forest Resource | 4 |
| Resource Management..... | 4 |
| Human Dimensions | 4 |
| Delphi Method | 5 |
| Participants..... | 6 |
| 3. Delphi One – Exploration | 7 |
| TABLE 1 Delphi Participants’ Employment Affiliation | 6 |
| TABLE 2 Delphi Participants’ Work Base by Population..... | 6 |
| Forest Resource | 7 |
| Resource Management..... | 7 |
| Human Dimensions | 7 |
| Science Goals | 12 |
| TABLE 3 Delphi I, Forest Resource Issues | 8 |
| TABLE 4 Delphi I, Resource Management Issues | 10 |
| TABLE 5 Delphi I, Human Dimensions Issues..... | 11 |
| 4. Delphi Two – Importance & Outreach | 12 |
| TABLE 6 Delphi II Issues-Means by Themes..... | 13 |
| TABLE 7 Delphi II Outreach Message & Audiences..... | 14 |
| 5. Discussion & Recommendations | 15 |
| Research and Outreach Partners..... | 16 |
| TABLE 8 Professional Memberships of Delphi Participants..... | 16 |
| 6. References | 17 |
| Appendix I: Delphi I Participant Invitation and Instrument | 19 |
| Appendix II: Delphi II Participant Invitation and Instrument | 19 |
| Appendix III: Potential Research Partners | 19 |

THIS PAGE INTENTIONALLY LEFT BLANK

**URBAN FORESTRY RESEARCH
& TECHNOLOGY TRANSFER:
PACIFIC NORTHWEST REGIONAL ASSESSMENT**

EXECUTIVE SUMMARY

PROJECT PURPOSE

This document reports the outcomes of an exploratory process to assess and understand research needs for urban forestry in the Pacific Northwest region. The urban forest is a natural resource of great biological and social complexity, thus the input gathering process included diverse groups of expert stakeholders.

Clark and his colleagues (1997) described a model for urban forest sustainability based on three themes: Forest Resource, Management, and Human Dimensions. The model illustrates how to achieve sustainable urban forests through community cooperation, quality care, continued funding, and personal involvement. It emphasizes the need for vision and responsibility, for direct intervention with the resource, and for stewardship programs that are on going and responsive.

APPROACH

A two phase, abbreviated Delphi process was administered by a team representing the University of Washington and the U.S. Forest Service. About 60 stakeholders representing non-profits, industry, academia, and local, state, and federal agencies were recruited and asked to respond to on-line questions. Their answers revealed a wide range of research issues, and emphasized that most are of high priority. This report presents a concise package of research need statements.

WHAT DID WE LEARN?

The responses of PNW stakeholders align closely with the principles of the sustainable urban forests model, but amplify challenges and needs that are particular to the political and landscape contexts of the region. Respondents provided a broad array of insights about how arboricultural, ecological, and social sciences could provide better knowledge and guidance for sustaining urban trees in Alaska, Oregon and Washington.

Within and between the three themes of Forest Resource, Management, and Human Dimensions a number of issues were revealed (see table), and most were judged to be of high priority for scientific study.

Research needs range from the scale of visioning across multiple large governmental agencies, to practical tree and forest care by small property owners. Recommendations for study of the resource itself range from biodiversity of interconnected green spaces across the region, to how to provide positive growing conditions for individual trees in the most hardscaped environments.

| Forest Resource Issues | Resource Management Issues | Human Dimensions Issues |
|--|--|--|
| urbanization & development impacts | adequate funding & staff | improve public appreciation & understanding |
| health conservation & retention | integrate forests with other city systems | lack of public & elected leadership |
| aquatic resource quality & stormwater management | develop/implement best practices | understand & recognize human & economic benefits |
| habitat loss & fragmentation | inadequate policy, code & regulations | integration across institutions & agencies |
| invasive species detection & management | inadequate vision/awareness & knowledge | volunteers & citizen stewards |
| climate change & carbon dynamics | implement ecosystem services/green infrastructure | private property action & user conflicts |
| adequate tree spaces | conduct consistent & routine management | enable appropriate uses & interactions |
| loss of biodiversity & ecological complexity | conduct inventory, assessment & monitoring | |
| | comprehensive programs at regional/landscape scale | |

Urban Forest Research - Sustainability Themes with Key Issues

NEXT STEPS?

This document can be used to guide research and funding proposals at state, regional, national levels, as the issues align with recently published national research concerns (Clark et al. 2005). For instance, the U.S. Forest Service has identified these four major science areas: Resource Valuation and Use; Science Policy, Planning, Inventory and Information; Vegetation Management and Protection; Wildlife, Fish, Water, and Air. The issues emerging from this assessment are similar, with respondents noting the need for research that addresses diverse populations and governmental entities, and that spans the region and landscape.

The range and scope of need that was expressed provides great opportunity for building a research program. As funding initiatives are announced this collection can serve as a pool from which several issues can be integrated to prepare research proposals. The needs are so great that science start-ups can include any number of scientific disciplines, and generate much needed contributions.

URBAN FORESTRY RESEARCH & TECHNOLOGY TRANSFER:

PACIFIC NORTHWEST REGIONAL ASSESSMENT

1. INTRODUCTION

Urban forests provide a diverse mix of goods and services that benefit people. Urban forestry is the art, science and technology of managing trees, forests and natural systems in and around cities, suburbs and towns for the health and well-being of all people (NUCFAC 2006). With 83 percent of America's residents living in urban areas urban forests and urban forestry are becoming increasingly important. The population distribution in the Pacific Northwest (PNW) states, particularly Oregon and Washington, mirrors this national average, with Alaska showing a slightly less urban population (U.S. Census). Urban forests are important resources in the Pacific Northwest.

Research in urban forestry has generated extensive knowledge about environmental, social and economic benefits of trees and forests for individuals and communities. Research also contributes to evidence-based best management practices. While much of the scientific information generated by other USFS Research Stations and scientific cooperators are generalizable to the PNW, unique local conditions merit study, replication, or expansion to confirm applicability. In addition, the PNW is a rapidly growing region, and study of both urban and urbanizing landscapes can provide valuable knowledge for other locales in the United States. More research and outreach is needed to better understand resource issues, improve management approaches, build networks, and create better local government policy concerning city trees (Clark et al. 2005).

This project was a process of discovery to explore and understand the urban forestry research and technology transfer needs in the PNW region using a stakeholder participatory process. A two phase abbreviated Delphi process was conducted, inviting input from urban forestry professionals, academics, and agency-based managers. Respondents were first asked to identify research issues, then later asked to prioritize the issues within three themes: urban forest resource, resource management, and human dimensions. The resulting information, summarized here, provides a framework to guide future research and research funding efforts at regional and national levels. In addition, results concerning outreach messages and audiences can guide urban forestry technology transfer in the PNW.

The University of Washington partnered with the Pacific Northwest Research Station of the U.S. Forest Service on this project. While wildland and production forest research needs have been assessed periodically in the region, this is the first assessment of research needs for the forests that are a part of the places where most people live, work, play and learn. The project has identified potential collaborators and contributors in future scientific programs, and will help establish priorities among many science and information needs. It is hoped that these results will

launch more research to better understand the urban forest resource and how to manage it, and contribute to governmental policy and other human dimensions applications.

2. BACKGROUND

DELPHI THEMES – URBAN FOREST SUSTAINABILITY

Creation and management of urban forests to achieve sustainability is a long-term goal of an ever-increasing number of communities in the PNW. The most significant outcomes of a sustainable urban forest are to generate the maximum level of net environmental, ecological, social, and economic benefits. In light of this focus, a model of urban forestry sustainability, developed by James Clark and colleagues (1997), served as the basis for the Delphi process.

Urban forestry involves considerable complexity with regard to both the forest resource and the management programs that influence it. Communities also vary in both ecological possibilities and societal desires. Recognizing this complexity and the higher human population densities associated with city trees, the model incorporates social and economic factors, as well as aspects of biophysical systems. The model proposes that sustainable urban forests have requirements based on three themes - a healthy tree and forest resource, community-wide support (or human dimension) and a comprehensive resource management approach. In the Delphi process we asked participants to respond to each of the major themes.

FOREST RESOURCE

Vegetation is the essential element of a citywide ecosystem. The vegetation resource of a sustainable urban forest can and should provide a continuous high level of net benefits including energy conservation, reduction of atmospheric contaminants, enhanced property values, reduction in storm water run-off, and social well-being. The composition, extent, distribution, and health of an urban forest define the type, quality, and level of benefits provided and costs accrued. As dynamic organisms, urban forests (and the trees that form them) change over time as they grow, mature and die. Therefore, forests must possess a mix of species, sizes and ages that allows for continuity of benefits while trees grow, die, and are planted and removed.

RESOURCE MANAGEMENT

This theme includes the direct management of the resource, as well as the philosophy of management. Specific policy strategies describe how to protect existing trees, manage species selection, train staff, and apply standards of care that focus on the tree resource itself. At a broader scale, acceptance of a comprehensive management plan and program funding by local government and its constituents enables communities to develop and pursue a shared vision. Local management approaches vary as a function of the resource and its extent and must be considered with the context of the larger landscape, and across multiple political jurisdictions.

HUMAN DIMENSIONS

A sustainable urban forest is one in which all sectors of the community share a vision for forests located in neighborhoods, public spaces and on private lands and work to transform the vision into reality through specific goals and objectives. At one level, an attainable vision requires that a community agree on the benefits of trees and act to maximize those benefits. On another level,

this cooperation requires that private landowners acknowledge the key role of their trees in community health. Finally, in an era of reduced government service, this means sharing the financial burden of caring for the urban landscape. While the original model termed these dynamics “community framework” we use the term “human dimensions.”

DELPHI METHOD

The Delphi method is a systematic interactive technique for obtaining information from a panel of independent experts without the need to meet face-to-face. It is used to help identify issues, set goals and priorities, clarify positions and differences across groups, and identify solutions (Delbecq et al. 1986). It is based on well-researched principles, and results in information that is more accurate than that obtained from unstructured groups (Rowe and Wright 1999, 2001).

Using Delphi procedures experts are asked to respond to a small number of questions over two or more rounds. Delphi typically includes experts who cannot meet physically, so is conducted by mail or e-mail. In each round a facilitator sends out a set of questions (or one broad question) that is the focus of the Delphi effort and if the panel of experts accept, they follow instructions and present their understanding and perspectives. The initial question(s) is/are very broad, and focus on issues, objectives, needs, solutions, or forecasts. The second question set builds on first round responses and may ask for clarification, level of agreement, or urges respondents to rank or prioritize items that have been submitted in previous rounds.

After each round, the facilitator provides a generalized summary of the responses that have been received. The facilitator controls the interactions among the participants by processing the information and filtering out irrelevant content. The process continues through thesis and antithesis, to gradually work towards synthesis, and building consensus. While the facilitator knows the identities of respondents and how they have responded, the information reported to the group is not attributed to specific individuals. The process stops when submissions have changed little between rounds, consensus is approached, or sufficient information is obtained to satisfy the needs of the effort (Delbecq et al. 1986). Final round responses are combined, summarized, and reported back to participants. From that a framework or timetable of future developments can be derived.

The Delphi method recognizes the value of expert opinion, experience and intuition. A Delphi is designed to accommodate emergent and spontaneous response to a broad request for information. It permits an informed dialog when full scientific knowledge is lacking. The anonymous response format avoids the negative affects of face-to-face panel discussions and solves the usual problems of group dynamics. These key characteristics of the Delphi method help participants to focus on core issues, and separate Delphi from other methodologies in light of the 1) structuring of information flow, 2) cycles of relevant feedback, and 3) anonymity of the participants.

For this project two rounds of Delphi method were used. The purpose of the Delphi was to discover a broad array of urban forestry research issues, and then determine priorities. A team made up of representatives from the US Forest Service and University of Washington prepared a participant recruitment list and designed questions. Dr. Kathleen Wolf served as the Delphi facilitator, with questions posed to participants using WebQ, the University of Washington’s web-based survey tool. The first Delphi round occurred in November and December of 2006;

Appendix I contains recruitment information and the on-line questionnaire. The second round took place in July 2007; materials are found in Appendix II.

PARTICIPANTS

Potential participants were selected with two general criteria in mind. First, effort was made to select individuals who, through their employment history and participation in regional professional activities, have demonstrated an interest in planning and development in urban forestry. Second, effort was made to provide a diverse base of professional experience and affiliations by participants (Table 1).

The project team developed, pretested, and finalized the Delphi questions, then recruited participants. An e-mail invitation provided a link to the online Delphi questions, with a reminder sent a week later. All responses were anonymous. In the first Delphi phase there were 42 out of 66 replies, or 64 percent response. The team analyzed results from the first phase, set up the second phase and repeated the recruitment process with 37 out of 62, or 62 percent responding.

Tables 1 and 2 provide information about the participants. Participant representation by state for Delphi 1 was 20 percent for Alaska, 25 percent Oregon, and 55 percent Washington; representation in Delphi 2 was 22, 33, and 45 percent, respectively.

| Employment Affiliation | Participant Pool n=66 | Delphi 1 n=42 | Delphi 2 n=37 |
|--|------------------------------|----------------------|----------------------|
| Municipal/city government | | 26 | 30 |
| County/regional/borough/metro government | 35 | 2 | 3 |
| State government | 18 | 21 | 24 |
| Federal government | 7 | 14 | 3 |
| Non-profit organization | 11 | 14 | 14 |
| Business, company or firm | 12 | 12 | 11 |
| Educational/scientific institution | 17 | 19 | 16 |

TABLE 1 Delphi Participants' Employment Affiliation (%)
(Delphi column totals may include multiple responses)

| Community Population | Delphi 1 n=42 | Delphi 2 N=37 |
|------------------------------|----------------------|----------------------|
| More than 100,000 | 29 | 35 |
| From 50,000 to 100,000 | 12 | 5 |
| From 30,000 up to 50,000 | 5 | 11 |
| From 10,000 up to 30,000 | 5 | 0 |
| Less than 10,000 | 5 | 0 |
| Work in multiple communities | 36 | 16 |
| Doesn't apply | 10 | 0 |

TABLE 2 Delphi Participants' Work Base by Population (%)
(column totals include multiple or no response)

3. DELPHI ONE – EXPLORATION

The first phase of the Delphi process was conducted in November and December 2006. Questions within the three themes of Forest Resource, Resource Management, and Human Dimensions were presented on-line (Appendix I). In an unstructured, open-ended format each participant was asked to list the three most pressing issues within each theme. At the close of round one, responses were electronically downloaded, then prepared as text lists. Summary issue lists for each theme were generated using content analysis. Counts of text items were used to prepare percent distributions for each issue. Draft issues were reviewed and refined, and then final versions were used to design the second round.

FOREST RESOURCE

Table 3 displays issues resulting from the question, *What are the 3 most pressing issues concerning forests and ecosystems in urbanized places?* This question is about the natural resource. Many of the issues identified by participants related to landscape change associated with rapid urbanization in the region, including forest fragmentation, development impacts, and loss of biodiversity. Other issue topics are concerns that apply to both established city trees and remnant forests associated with recent development, such as invasive species, forest health, and adequate tree space. Finally, two issues focus on ecosystem services provided by quality urban forests - water quality, and carbon dynamics.

RESOURCE MANAGEMENT

Table 4 is a summary of responses to the question, *What are the 3 most pressing issues concerning how forests and ecosystems are managed in urbanized places?* This question is about practices and policies. Several of the issues that participants identified address the practical aspects of tree care, calling for the need to implement best management practices widely and consistently, with adequate staff and budgets, on a routine basis, and based on good inventories so that the results of management actions can be monitored. Several responses address political leadership in management, noting a need for greater vision concerning an essential urban ecosystem and comprehensive policy and codes. Finally, several management issues that participants identified urge broader integration of urban forestry with other governmental services and activities, both within local governments and across regional landscapes, to optimize ecosystem services and green infrastructure throughout the PNW.

HUMAN DIMENSIONS

Table 5 is a summary of responses to the question, *What are the 3 most pressing issues concerning how people interact with forests and ecosystems in urbanized places?* This question is about governments, organizations and individuals. Extensive research has identified and demonstrated the functions and benefits that city trees provide. Participants pointed out the widespread lack of knowledge and understanding concerning such benefits among citizens and public leaders. They also observed that communications and action about urban forests is not shared within and among resource agencies whose programs have impact across landscape systems. Concerning citizens and private property owners, there are tensions between appropriate uses for diverse human populations (particularly property rights) and the integrity of the forest resource. Finally, respondents noted that citizen volunteers conduct a certain level of forest management and asked how host organizations can better support citizen stewardship programs and themselves.

| Forest Resource Issues | % response | Response Examples |
|--|-------------------|---|
| Invasive Species Detection & Management | 21.1 | Introduction of non-native species Invasive species proliferation and dominance in degraded natural areas Invasive species (plants and animals) decimating urban open spaces |
| Habitat Loss & Fragmentation | 13.3 | Maintaining forests and ecosystems in pieces large enough to support a variety of ecosystem services Fragmentation and clearing that results in loss of habitat, wildlife corridors, and biodiversity, and disruption of other natural processes Pressure on remnant stands as marginal lands become economically viable for development and natural area corridors are further fragmented |
| UF Health Conservation & Retention | 12.5 | Declining urban forest health (disease, ecological and mechanical stresses) Declining tree cover and tree longevity Cultural practices to maximize the health and vitality of urban ecosystems |
| Aquatic Resource Quality & Stormwater Management | 11.7 | The role of urban forests and vegetation in protecting aquatic resources, including stormwater mitigation and riparian/shoreline edges Effects of urbanization on streams, watersheds and overall ecosystem health Increased runoff from impervious - eutrophication, scouring, temp changes |
| Urbanization & Development Impacts | 10.9 | Preserving significant trees during expanding roadways and rapid development Loss of urban forestry canopy Impacts due to development and the continual expansion of transportation systems |
| Loss of Biodiversity & Ecological Complexity | 10.2 | Loss of native species/PNW character and mature trees being replaced with young, deciduous trees all of similar age Flora diversity is not considered when development is planned Limited diversity in areas can jeopardize entire canopy in the event of major disease, insects, weather conditions |
| Climate Change & Carbon Dynamics | 8.6 | The effects of climate change and ecosystem response; i.e. invasive species, drought, forest regeneration, etc. Role of urban forests and green space in climate protection. How might vegetation help to mitigate climate change? Climate change - disruption of average rainfall amount resulting in increased pest outbreaks (Leaf miner, archnips rosana, spruce bark beetle) |
| Adequate Tree Spaces | 7.0 | Poor conditions for tree survival in urban settings (small root wells, poor soils, cutting roots for utility lines, compaction issues, etc) Understanding tree protection as it relates to soils, critical root zone, species, and groups vs. individuals Establishing better planting spaces to minimize infrastructure conflicts, allow for large tree species, increase individual tree longevity, and improve urban canopy coverage |

% response = items in issue based on 128 total text items

TABLE 3 Delphi I, Forest Resource Issues

| Resource Management Issues | % response | Response Examples |
|--|-------------------|--|
| Develop/Implement Best Practices | 18.8 | Increased awareness on maintaining the root health of trees both in public tree situations (parks, streets) and in private situations (preserving trees in development) Inconsistent implementation of industry standards and specifications relative to tree and vegetation plantings Ensuring that city staff have the skills, knowledge, and desire to implement practices and policies; often they are created with the best intentions but lack execution |
| Adequate Funding & Staff | 16.1 | Lack of urban forestry and ecosystem funding at local, state and federal levels Maintaining adequate funding levels to implement an adaptive management urban forestry program, which can be based on building/land use fees, municipal stormwater revenue, general fund, exactions, etc. Inadequate funding to protect and acquire open spaces of all sizes where trees can flourish |
| Integrate Forests with Other City Systems | 12.8 | How to most effectively implement green infrastructure practices within city systems Lack of centralized and coordinated municipal policies, regulations and enforcement to encourage more trees and protect existing stands The importance for cities to manage and coordinate their various municipal programs that bridge urban forestry |
| Inadequate Vision/Awareness & Knowledge | 10.7 | The urban forests and ecosystem need to be at the forefront of the planning process, not as an afterthought or a luxury Lack of public information/awareness and prioritization to urban forests Staff knowledge of forest/natural systems ecology and the ability to develop and implement site specific prescriptions to achieve and maintain healthy ecosystems in urban natural area sites |
| Conduct Consistent & Routine Management | 10.7 | Poor, inadequate or non-existent on-going maintenance Lack of proactive management of urban natural areas to achieve the environmental values and benefits for which they were set aside There is a lack of investment via the maintenance of existing trees and ecosystems, or the "native areas take care of themselves" mindset |
| Comprehensive Programs at Regional/Landscape Scale | 9.4 | No cohesive regional management strategies (ordinances, canopy cover goals, etc) Multiple agencies have staff tied to natural resource care that don't communicate with each other. Agency policy and practices are not tied together in a comprehensive way Balancing development pressure and urban growth with forest preservation and enhancement across the landscape gradient from urban to wildland |

| | | |
|---|-----|---|
| Adequate Policy, Code & Regulations | 9.4 | Need development of similar ordinances throughout a region that address the reasons why and how to protect the forests and ecosystems in a region, as municipalities have quite varied [regulatory] approaches to how to achieve desired outcomes Lack of policies and incentives that require and motivate developers to leave native forest remnants (rather than individual trees) on developing sites Ordinances, and especially enforcements of ordinances are needed |
| Implement Ecosystem Services/Green Infrastructure | 7.4 | Public do not see the urban forest infrastructure as an important utility that provides storm water relief/water quality, energy conservation/cooling, carbon sequestration/air quality & economic benefits Dissemination of green infrastructure case studies, documenting challenges and successes in other cities, national and international Need quantification of the functions trees provide in urban areas in the PNW lowlands, and need data to use to preserve trees and show their value in this ecosystem |
| Conduct Inventory, Assessment & Monitoring | 4.7 | Need resource inventory and assessment-we don't know what we have Urban forest health monitoring is needed to see changes in canopy cover, forest health, etc. Young tree survival -- little data on mortality rates, why trees die, and how to improve survival |

% response = items in issue based on 149 total text items

TABLE 4 Delphi I, Resource Management Issues

| Human Dimensions Issues | % response | Response Examples |
|--|-------------------|--|
| Improve Public Appreciation & Understanding | 22.9% | We need to reposition. Trees need to more align with politically important issues such economic development, alleviation of crime, reduction of health care costs, etc. Lack of understanding by the general public about the values of urban trees and forests for environmental, social, and economic benefits Most citizens and elected officials do not understand how natural processes work and how our actions impact them |
| Enable Appropriate Uses & Interactions | 20.3 | Changing ethnic demographics are changing the levels of appreciation for remnant forests and city trees How can urban forests and green spaces serve multiple populations and purposes: social space, the homeless, ecological services? We need to do research to understand children's critical interactions with plants |
| Understand & Recognize Human & Economic Benefits | 16.9 | [Should be] easier to access and utilize tools that measure, quantify and track forests benefits across time and location To preserve trees or to be able to plant more, we need to show they have functions that people would otherwise pay for Health impacts of the UF -- air quality, active living, mental health |
| Lack of Public & Elected Leadership | 16.1 | The need to engage in a meaningful dialogue with urban residents about urban AND rural forestry, and choices they can make to benefit both themselves, forests, and ecosystem functions Policy makers continually view trees and forests as "nice to have" amenities, without truly recognizing the services provided Lack of elected decision-makers at the state or local levels who are willing to be champions for community livability through urban forestry |
| Integration Across Institutions & Agencies | 10.2 | [Is now] no communication amongst myriad organizations responsible for managing a single resource Need for cross-jurisdictional approaches (integration of local, state and fed) to address forests across the entire landscape gradient - urban core, urban neighborhoods, suburbs, rural communities, wildlands A major focus on transportation system improvements without adequate mitigation for the impacts it has on natural systems and quality of life. |
| Private Property Action & Conflicts | 6.8 | Balancing urban forest preservation and enhancement with private property rights Incentive programs to stimulate private behavior in the public interest In PNW viewsheds are precious leading to canopy loss as trees obscure view and thus lower property values |
| Volunteers & Citizen Stewards | 4.2 | Awareness of importance of locally-based citizen initiatives Local stewardship groups [now] need to compete with each other for funding What drives people to grassroots nonprofits or voluntary service involving trees? How to increase service for trees/tree planting? |

% response = items in issue based on 118 total text items

TABLE 5 Delphi I, Human Dimensions Issues

SCIENCE GOALS

Overall the issues align with national research concerns for forests. For instance, the U.S. Forest Service has identified four major science areas: Resource Valuation and Use; Science Policy, Planning, Inventory and Information; Vegetation Management and Protection; Wildlife, Fish, Water, and Air. Issues emerging from the PNW needs assessment fall within each of these areas with respondents noting the need for research that addresses diverse populations and governmental entities, and that spans the region and landscape.

4. DELPHI TWO – IMPORTANCE & OUTREACH

The second phase of the Delphi process was conducted in July 2007. An on-line instrument was again used (Appendix II). In response to issues within each urban forestry theme (Forest Resource, Resource Management, and Human Dimensions), participants were asked to respond to the question, *How important are each of these issues concerning forests and ecosystems in urbanized places?* by rating each issue statement on a 1 to 5 scale, with 1 being “low importance” and 5 being “high importance.” Mean responses were calculated for each issue. Results ranged from the high of 4.68 for *improve public appreciation & understanding* to the low of 3.51 for *enable appropriate forest uses & interactions*. Table 6 displays mean importance ratings for all items.

Means were also calculated for each theme, across all component issues:

- 4.26 (0.49 sd) for Forest Resource
- 4.35 (0.39 sd) for Resource Management
- 4.12 (0.42 sd) for Human Dimensions

Theme means were compared to determine if work place or affiliation had any influence on stakeholders’ opinions. No differences were found based on participant employment affiliation. A significant difference was found associated with community size, with participants working with communities smaller than 100,000 population responding that Human Dimensions issues were of less importance (one way ANOVA, $df=34$, $F=7.744$, $p=.002$), rating them at 3.62 (sd 0.50), while those from larger communities rated them at 4.32 (sd 0.29). Participants from Alaska rated Resource Management issues as being more important (4.65, 0.38 sd) than participants from Oregon (4.25, sd 0.28) and Washington (4.30, sd 0.41), based on statistical analysis using one-way ANOVA ($df=35$, $F=3.295$, $p=.05$).

Generally, the Delphi participants rated all of the issues, within and across the themes, as important research needs. Reviewing each of the theme columns, with mean issue ratings proceeding from high to low, one sees no items at the midpoint of the scale or lower. No issue items received ratings below 3.5.

A ranking exercise, sometimes used in Delphi, would have required participants to distinguish high and low importance issues along a numeric list. Yet such an exercise would have forced an ordering of priority when, in reality, stakeholder responses suggest a great need for research and knowledge building across many issues.

| Forest Resource | | | Resource Management | | | Human Dimensions | | |
|--|------|------|--|------|------|--|--------------------|-------|
| Issue | Mean | SD | Issue | Mean | SD | Issue | Mean | SD |
| urbanization & development impacts | 4.62 | 0.72 | adequate funding & staff | 4.59 | 0.60 | improve public appreciation & understanding | 4.68 (high) | 0.63 |
| health conservation & retention | 4.59 | 0.69 | integrate forests with other city systems | 4.51 | 0.65 | lack of public & elected leadership | 4.32 | 0.75 |
| aquatic resource quality & stormwater management | 4.41 | 0.73 | develop/implement best practices | 4.49 | 0.73 | understand & recognize human & economic benefits | 4.19 | 0.85 |
| habitat loss & fragmentation | 4.32 | 0.71 | adequate policy, code & regulations | 4.43 | 0.77 | integration across institutions & agencies | 4.19 | 0.74 |
| invasive species detection & management | 4.24 | 0.86 | inadequate vision/awareness & knowledge | 4.32 | 0.85 | volunteers & citizen stewards | 4.11 | 0.83 |
| climate change & carbon dynamics | 4.08 | 1.04 | implement ecosystem services/green infrastructure | 4.32 | 0.78 | private property action & user conflicts | 3.81 | 0.85 |
| adequate tree spaces | 3.95 | 1.00 | conduct consistent & routine management | 4.25 | 0.69 | enable appropriate uses & interactions | 3.51 (low) | 0.387 |
| loss of biodiversity & ecological complexity | 3.84 | 1.01 | conduct inventory, assessment & monitoring | 4.19 | 0.78 | | | |
| | | | comprehensive programs at regional/landscape scale | 4.00 | 0.85 | | | |

TABLE 6 Delphi II Issues-Issue Means by Themes
(1=low importance and 5=high importance)

| | Citizens & Small Property Owners | Property Developers | City/County Planning Staff | City/County Public Works Staff | Elected Officials in Local Government |
|------------------------------|--|---|--|--|--|
| Urban Forest Resource | invasive species detection & management (26%) UF health conservation & retention (14%) urbanization & development impacts (12%) | urbanization & development impacts (30%) habitat loss & fragmentation (15%) UF health conservation & retention (15%) | urbanization & development impacts (22%) habitat loss & fragmentation (19%) UF health conservation & retention (18%) | aquatic resource quality & stormwater management (25%) need for adequate tree spaces (18%) UF health conservation & retention (17%) | urbanization & development impacts (27%) UF health conservation & retention (21%) climate change & carbon dynamics (17%) |
| Resource Management | inadequate vision/awareness & knowledge (27%) conduct consistent & routine management (18%) develop/implement best practices (17%) | develop/implement best practices (29%) inadequate vision/awareness & knowledge (21%) implement ecosystem services/green infrastructure (14%) | integrate forests with other city systems (25%) comprehensive programs at regional/landscape scale (18%) adequate policy, code & regulations (16%) | develop/implement best practices (24%) conduct consistent & routine management (20%) conduct inventory, assessment & monitoring (19%) | adequate funding & staff (28%) adequate policy, code & regulations (23%) inadequate vision/awareness & knowledge (16%) |
| Human Dimensions | improve public appreciation & understanding (25%) private property action & user conflicts (22%) volunteers & citizen stewards (21%) | understand & recognize human & economic benefits (30%) private property action & user conflicts (23%) improve public appreciation & understanding (22%) | integration across institutions & agencies (31%) enable appropriate uses & interactions (22%) understand & recognize human & economic benefits (17%) | integration across institutions & agencies (28%) enable appropriate uses & interactions (19%) understand & recognize human & economic benefits (18%) | lack of public & elected leadership (26%) improve public appreciation & understanding (22%) understand & recognize human & economic benefits (22%) |

TABLE 7 Delphi II Outreach Message & Audiences Regarding Urban Forestry Research Issue

% = number of Delphi participants listing the issue as one of 3 important messages for an audience

Much research currently exists concerning urban forest attributes, management and societal benefits. Another purpose of this project was to identify key message content and target audiences for this information. Again, building on the three themes, participants were asked to list current and future scientific knowledge that is most important to communicate. Results are provided in Table 7. Within each theme participants indicated the issues that are the most important to understand for each of five audiences: citizens and small property owners, property developers, city/county planning staff, city/county public works staff, and elected officials in local government.

There are two ways to interpret Table 7. First, looking across rows, one can see the relative importance of issues across audiences. These cells serve to highlight the most important outreach topics among all the Delphi outcomes, with percentages indicating participants' ranking of importance. If reviewing the columns, one can determine key messages by theme for each of the five audiences. If an agency or organization wanted to develop informational materials intended for specific audiences this column provides guidance for key content.

5. DISCUSSION & RECOMMENDATIONS

In the Urban Forest Sustainability model Clark and his colleagues (1997) described how to achieve sustainable urban forests through community cooperation, quality care, continued funding, and personal involvement. Sustainable urban forests are created and maintained through shared purpose and cooperation, with maximizing benefits and minimizing costs being constant pursuits. The model identifies the need for vision and responsibility, for direct intervention with the resource, and for programs of care that are on going and responsive. Such vision and activity extends a traditional orientation of urban forest management from municipal trees alone to the mix of public and private trees.

The responses of PNW stakeholders about research needs and issues align closely with the principles of the sustainable urban forests model and amplify challenges and needs that are particular to the political and landscape contexts of the region. Respondents provided a broad array of insights about how arboricultural, ecological, and social sciences could provide better knowledge and guidance for sustaining urban trees in Alaska, Oregon and Washington.

Within and across the three themes of Forest Resource, Management, and Human Dimensions most issues were judged to be of high priority for scientific action. Knowledge building needs range from the scale of visioning across multiple large governmental agencies, to practical tree and forest care by small property owners. Recommendations for study of the resource itself range from biodiversity of interconnected green spaces across the region, to how to provide positive growing conditions for individual trees in the most hardscaped environments.

The range and scope of need that was expressed provides great opportunity for building a research program. As funding initiatives are announced this collection can serve as a pool from which several issues can be integrated to prepare research proposals. The needs are so great that science start-ups can address any number of scientific disciplines, and generate much needed contributions.

RESEARCH AND OUTREACH PARTNERS

Urban forestry research is being sponsored in other regions of the U.S. The most successful projects involve collaborations among scientists, agency program staff, local government officials, non-profit organizations, and in some cases, citizens. Science partnerships are necessary owing to the diverse ownership base for urban forests, and the fact that a landscape based resource usually spans multiple political jurisdictions.

Some prior research has relevance for PNW communities and situations, yet there is not yet a recognized vehicle for preparing and distributing the information and products. Perhaps a beneficial first step would be an assessment of potential research products and a plan for their production and distribution.

Two questions within the Delphi process provide information about potential partners in future research and outreach efforts. In the first Delphi participants were asked about their membership in professional organizations (Table 8). The results indicate professional organizations that could be recruited, and might be interested in partnering for future outreach and technology transfer projects. These partners would be particularly helpful in the distribution of urban forestry knowledge to local staff and professionals.

| Professional Affiliation | Delphi 1 n=42 |
|--|--------------------------|
| International Society of Arboriculture | 62 |
| Society of Municipal Arborists | 29 |
| American Society of Landscape Architects | 12 |
| American Planning Association | 10 |
| Society of American Foresters | 7 |
| American Society of Consulting Arborists | 5 |
| Other (ecology, restoration, recreation, public works, local government) | 31 |

TABLE 8 Professional Memberships of Delphi Participants (%)
(column percentages reflect multiple responses)

In the second Delphi round respondents were asked to respond to the question, *Do you know of a program or organization(s) that would be interested in partnering for research?* Would your own organization be interested in participating? Tables in Appendix III summarize responses to this question. Information about potential partners is brief in some instances, and follow up questions would provide a more complete picture of research interests and capacities. Nonetheless, the range of the scope of work and the diversity of on-the-ground programs suggests fertile opportunities for research. Many respondents indicated that research collaboration is within their mission and scope of work.

This report summarizes the outcomes of a brief exploratory process to assess and understand urban forestry research and technology transfer needs in the PNW region. The urban forest is a natural resource of great biological and social complexity, thus a process to solicit expert stakeholder input was devised. A two phase, abbreviated Delphi process revealed a wide range of research issues, and emphasized that most are of high priority. This report presents a concise package of need statements organized within three themes: urban forest resource, resource management, and human dimensions. This document can be used to guide research and funding proposals at state, regional, national levels. Technology transfer is also important and respondents helped identify key audiences for urban forestry outreach. Both activities – scientific research and focused technology transfer – are necessary to attain sustainable urban forests in the Pacific Northwest region.

6. REFERENCES

- CLARK, J.R., N.P. MATHENY, G. CROSS, and V. WAKE. 1997. A model of urban forest sustainability. *Journal of Arboriculture* 23 (1): 17-30.
- CLARK, J., W. KRUIDENIER, and K. WOLF. 2005. *National research plan for urban forestry 2005-2015*. Washington D.C.: National Urban and Community Forestry Advisory Council/U.S. Forest Service, 20 p.
- DELBECQ, A.L., A.H. VAN DE VEN, and D.H.GUSTAFSON. 1986. *Group techniques for program planning: a guide to nominal group and Delphi processes*. Middleton, WI: Green Briar Press, 174 p.
- NUCFAC (National Urban and Community Forestry Advisory Council). 2006. *Ten-year action plan (2006-2016)*. Washington D.C.: U.S. Forest Service.
- ROWE, G., and G. WRIGHT. 1999. The Delphi technique as a forecasting tool: issues and analysis. *International Journal of Forecasting* 15: 351-381.
- ROWE, G., and G. WRIGHT. 2001. Expert opinions in forecasting: the role of the Delphi technique. In J.S. ARMSTRONG (ed.), *Principles of forecasting*. Boston: Kluwer Academic Publishers, pp. 125-144.

THIS PAGE INTENTIONALLY LEFT BLANK

THREE APPENDICES FOLLOW:

APPENDIX I: DELPHI I PARTICIPANT INVITATION AND INSTRUMENT

APPENDIX II: DELPHI II PARTICIPANT INVITATION AND INSTRUMENT

APPENDIX III: POTENTIAL RESEARCH PARTNERS

THIS PAGE INTENTIONALLY LEFT BLANK

-
-

USDA Forest Service

Pacific Northwest Region - Alaska, Oregon and Washington

Urban Forestry Research and Outreach

NEEDS and ISSUES IDENTIFICATION

The USDA Forest Service, in cooperation with the University of Washington, is assessing urban forestry needs and issues in Washington, Oregon, and Alaska. We are using a series of efforts to develop a science and research agenda for the region.

You will find several questions below. It should take you about 15 minutes to answer the questions.

The project team will collate this information, then contact you again with some follow-up questions (known as a Delphi process). This information will then be used to plan an urban forestry science workshop in 2007.

Section I: NEEDS and ISSUES

Some time ago Jim Clark (and colleagues) wrote an article about urban forest sustainability.¹ These questions build on that framework:

I.1. What are the 3 most pressing issues concerning forests and ecosystems in urbanized places? This question is about the natural resource.

I.2. What are the 3 most pressing issues concerning how forests and ecosystems are managed in urbanized places? This question is about practices and policies.

I.3. What are the 3 most pressing issues concerning how people interact with forests and ecosystems in urbanized places? This is about governments, organizations and individuals.

I.4. What are other important issues, in your opinion?

I.5. Which issue(s) of those listed above will be most urgent in the decade ahead? And why?

I.6. What will be the consequences if such issue(s) are not addressed?

Section II: QUESTIONS ABOUT YOU

II.1. What type of organization do you work for? (please check all that apply)

Required. Select one or more answers.

- Municipal/city government
- County/regional/borough/metro government
- State government
- Federal government
- Non-profit organization
- Business, company or firm
- Educational/scientific institution

Other:

II.2. What is the population of the community that you work in?

Required.

- Doesn't apply
- Work in multiple communities
- More than 100,000
- From 50,000 to 100,000
- From 30,000 up to 50,000
- From 10,000 up to 30,000
- Less than 10,000

II.3. Which professional organizations do you belong to? (check all that apply)

- (ISA) International Society of Arboriculture
- (SMA) Society of Municipal Arborists
- (ASCA) American Society of Consulting Arborists
- (SAF) Society of American Foresters
- (ASLA) American Society of Landscape Architects
- (APA) American Planning Association

Other:

II.4. What is the zip code of your office address?

Required.

II.5. Can you recommend two other people who should be invited to participate in this assessment of research issues and needs? (names, affiliations, e-mail addresses):

Thanks for taking the time to answer these questions!

¹Clark, J. R., N. P. Matheny, G. Cross & V. Wake. 1997. A Model of Urban Forest Sustainability. Journal of Arboriculture 23 (1): 17-30. Download 940 KB PDF file: <http://www.cfr.washington.edu/research.envmind/Policy/ClarkSstnabltlyModel.pdf>

Questions or Comments?

Contact Dr. Kathy Wolf at kwolf@u.washington.edu



Questions, comments, or problems?

Contact us or email catalysthelp@u.washington.edu

THIS PAGE INTENTIONALLY LEFT BLANK

USDA Forest Service

Pacific Northwest Region - Alaska, Oregon and Washington

Urban Forestry Research and Outreach

NEEDS and ISSUES IDENTIFICATION

The USDA Forest Service, in cooperation with the University of Washington, is assessing urban forestry needs and issues in Washington, Oregon, and Alaska. We want to better understand science and research needs in our region.

We asked for input from a group of people earlier. We collated and analyzed that information and now have some follow-up questions (known as a Delphi process). Results of this second (and final) phase will be used to explore urban forestry science opportunities later this year.

The project team appreciates the time and effort you are giving this project!

You will find several sets of questions below. It should take you about 20 minutes to answer the questions.

Section I: NEEDS and ISSUES

We did a content analysis on the first round of answers to questions about forest resources, management issues, and human dimensions. The following sets of questions will help us prioritize research needs and issues.

I.1. How important are each of these issues concerning forests and ecosystems in urbanized places? These questions are about the natural resource.

| | 5 = high importance | 4 | 3 | 2 | 1 = low importance |
|--|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| invasive species detection & management | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| habitat loss & fragmentation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| UF health conservation & retention | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| aquatic resource quality & stormwater management | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| urbanization & development impacts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| loss of biodiversity & ecological complexity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| climate change & carbon dynamics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| adequate tree spaces | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

I.2. How important are each of these issues concerning how forests and ecosystems are managed in urbanized places? These questions are about management practices and policies.

| | 5 = high importance | 4 | 3 | 2 | 1 = low importance |
|--|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| develop/implement best practices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| adequate funding & staff | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| integrate forests with other city systems | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| inadequate vision/awareness & knowledge | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <hr/> | | | | | |
| conduct consistent & routine management | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <hr/> | | | | | |
| comprehensive programs at regional/landscape scale | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <hr/> | | | | | |
| adequate policy, code & regulations | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <hr/> | | | | | |
| implement ecosystem services/green infrastructure | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <hr/> | | | | | |
| conduct inventory, assessment & monitoring | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

I.3. How important are each of these issues concerning how people interact with forests and ecosystems in urbanized places? These questions are about the human dimensions of governments, organizations and individuals.

| | 5 = high importance | 4 | 3 | 2 | 1 = low importance |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| improve public appreciation & understanding | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <hr/> | | | | | |
| enable appropriate uses & interactions | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <hr/> | | | | | |
| understand & recognize human & economic benefits | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <hr/> | | | | | |
| lack of public & elected leadership | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <hr/> | | | | | |
| integration across institutions & agencies | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| private property action & user conflicts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| volunteers & citizen stewards | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

I.4. Are there any other important issues not mentioned above?

Section II: BUILDING ON STRENGTHS

Partnership with local professionals and programs is essential to good research. What are the success stories in our region? Is there a community, program and/or staff that could become a start-up site for urban forestry research?

II.1. Urban forest research often includes a blend of scientific study and practical programs. Do you know of a program or organization(s) that would be interested in partnering for research? Would your own organization be interested in participating?

Please provide a brief description of the program or organization. And provide a contact name.

Program or Organization:

Contact Information (name, e-mail, phone, web site):

Section III: QUESTIONS ABOUT YOU

III.1. What type of organization do you work for? (please check all that apply)

Required. Select one or more answers.

- Municipal/city government
- County/regional/borough/metro government
- State government
- Federal government
- Non-profit organization
- Business, company or firm
- Educational/scientific institution
- Other:

III.2. What is the population of the community that you work in?

Required.

- Doesn't apply
- Work in multiple communities

- More than 100,000
- From 50,000 to 100,000
- From 30,000 up to 50,000
- From 10,000 up to 30,000
- Less than 10,000

III.3. What is the zip code of your office address?

Enter a number (without commas).

Next

Cancel

Questions or Comments?

Contact Dr. Kathy Wolf at kwolf@u.washington.edu



Questions, comments, or problems?

Contact us or email catalysthelp@u.washington.edu

•

Section IV: COMMUNICATIONS

In the first Delphi round there were many comments about the need to communicate better about urban and community forestry.

We ask you to take just a few more minutes to complete this final section.

Below are questions about several communications audiences:

- citizens and small property owners
- property developers
- staff in city/county planning departments
- staff in city/county public works departments
- elected officials in local government

For each audience, select up to 3 topics that should be of highest priority.

IV. 1. Consider the list of topics. Again, these are about the **forest resource**.

Which of these are most important to communicate to each of the five audiences? Select up to **3 topics per audience** column.

| | citizens & small property owners | property developers | city/county planning staff | city/county public works staff | local government elected officials |
|---|-------------------------------------|--------------------------|-------------------------------|-----------------------------------|---------------------------------------|
| invasive species detection & management | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| ----- | | | | | |
| habitat loss & fragmentation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| ----- | | | | | |
| UF health conservation & retention | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| ----- | | | | | |

| | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| aquatic resource quality & stormwater management | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| urbanization & development impacts | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| loss of biodiversity & ecological complexity | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| climate change & carbon dynamics | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| adequate tree spaces | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

IV. 2. Consider the list of topics. Again, these are about **management practices and policies**.

Which of these are most important to communicate to each of the five audiences? Select up to **3 topics per audience** column.

| | citizens & small property owners | property developers | city/county planning staff | city/county public works staff | local government elected officials |
|--|----------------------------------|--------------------------|----------------------------|--------------------------------|------------------------------------|
| develop/implement best practices | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| adequate funding & staff | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| integrate forests with other city systems | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| inadequate vision/awareness & knowledge | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| conduct consistent & routine management | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| comprehensive programs at regional/landscape scale | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| adequate policy, code & regulations | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| implement ecosystem services/green infrastructure | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| conduct inventory, assessment & monitoring | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

IV. 3. Consider the list of topics. Again, these are about the **human dimensions of governments, organizations and individuals.**

Which of these are most important to communicate to each of the five audiences? Select up to **3 topics per audience** column.

| | citizens & small property owners | property developers | city/county planning staff | city/county public works staff | local government elected officials |
|--|----------------------------------|--------------------------|----------------------------|--------------------------------|------------------------------------|
| improve public appreciation & understanding | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| enable appropriate uses & interactions | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| understand & recognize human & economic benefits | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| lack of public & elected leadership | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| integration across institutions & agencies | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| private property action & user conflicts | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| volunteers & citizen stewards | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

IV.4. Are there any other important communications topics not mentioned above? Or audiences?

Thanks for taking the time to answer these questions!

Previous

Next

Cancel

Questions or Comments?

Contact Dr. Kathy Wolf at kwolf@u.washington.edu



Questions, comments, or problems?

Contact us or email catalysthelp@u.washington.edu

APPENDIX III: POTENTIAL RESEARCH PARTNERS

| Non-Profit Organizations | Comment | Contact Info |
|--|---|---|
| Green Seattle and other Green City Partnerships | need to get together a council of advisors to drive research needs, establish vision for the region | John Floberg, johnf@cascadeland.org, 206-292-5907 X115 |
| Portland Audubon | Portland Audubon would be interested in participating in a scientific/practical program. We are located in a unique environment: we own and manage 150 acres of forests within a 5,000 urban park minutes from Portland. Forest Park is heavily used by visitors, residents for a variety of purposes. Currently, we are just beginning to work on a natural resource management plan for invasive species, water quality and wildlife. | Tom Costello, Sanctuaries Director 503-292-6855 |
| Alaska Community Forestry Program | We have successful partnerships with the University of Alaska Cooperative Extension Service, the American Society of Landscape Architects Alaska Chapter, and local governments. We are interested in partnering in research as well. | Patricia Joynes, Program Coordinator, patricia.joyner@alaska.gov 907-269-8465 |
| PNW Chapter of International Society of Arboriculture (ISA) | Pacific Northwest ISA's mission is to foster a greater appreciation of trees and promote the professional practice of arboriculture through education, research, and technology. -- While we continue to contribute to the Tree Research and Education Endowment Fund, PNW members have expressed repeated interest in more regional research endeavors specific to the Northwest. | Patty Williams, Executive Director, pwilliams@pnwisa.org, 503/312-0245 (cell), www.goodtreepeople.org |
| World Forestry Center | | rzenn@worldforestry.org |
| Mountains to Sound Greenway Trust | Mountains to Sound Greenway Trust- land conservation and stewardship, education, volunteers. Forest restoration in many urban growth areas. | Doug Schindler, doug.schindler@mtsgreenway.org |

| Government, Agencies, & Infrastructure | Comment | Contact Info |
|--|---|---|
| <p>City of Kirkland, WA</p> | <p>Our program has a .75 Urban Forester in the Planning Dept. reviewing all new development and regulating tree removal on private property. Public Works has a .5 Field Arborist and supervisor managing trees in public right-of-way, parks, and other city-owned property. Planning also has two code enforcement officers who regularly respond to illegal tree removals and protection violations. -- We have a 2-year-old inventory, and are currently exploring ways in which to update/use the information. -- We have an extremely supportive "green" community, and elected officials. UF is also an important part of a city-wide "Green Team," charged with addressing overall environmental issues w/the city. -- The community is struggling with high-end development on small, individual lots. There are rarely opportunities to preserve tracts, remnant stands, etc. Most preservation is of single trees. The tree ordinance has been in effect since Jan. 2006, and we will be going through a comprehensive amendment process in late 2007-2008. -- Kirkland is a 5-year Tree City USA, and we wish to expand into offering a tree planting program, consistent ROW tree monitoring and maintenance, and including more volunteers in tree-related activities. -- Looming on the horizon in 2008 or 2009 is a potential annexation process that would nearly double the size of the city.</p> | <p>Urban Forester, Planning Department, sray@ci.kirkland.wa.us, (425) 587-3261, ci.kirkland.wa.us</p> |
| <p>Urban Forestry, City of Eugene Parks and Open Spaces Division of Public Works</p> <p>City of Anchorage Alaska</p> | | <p>Mark R. Snyder, Urban Forester. mark.r.snyder@ci.eugene.or.us 541-682-4819 www.eugene-or.gov</p> <p>Patricia Joyner</p> |

| | | |
|--|---|---|
| <p>City of Vancouver WA, Urban Forestry</p> | <p>Yes, we would be interested in partnering if the research project is a good fit with our current or planned programs or goals. -- City of Vancouver's municipal urban forestry program; three full-time staff. The mission of Vancouver's Urban Forestry Program is to maximize the aesthetic, environmental and economic benefits that trees provide to city residents and visitors by preserving, managing and enhancing existing trees and other vegetation and promoting the reforestation of the urban area, through an active integrated program with community support and participation. See work plan, annual report, and draft Urban Forestry Management Plan on the website. -- We also work very closely with Friends of Trees (www.friendsoftrees.org), the Portland-based community tree planting and urban forest stewardship organization, so there is an excellent opportunity for academic/municipal/non-profit partnership.</p> | <p>Charles Ray: charles.ray@ci.vancouver.wa.us, (360) 619-1108 / (360) 619-1128, www.cityofvancouver.us/urbanforestry</p> |
| <p>City of Seattle Parks and Recreation - Urban Forestry Program</p> | <p>Manages over 125,000 trees in developed parks, over 2,500 acres of forested parkland and over 100 miles of urban trails. The creation of the Green Seattle Partnership capitalizes on the annual 75,000 plus volunteer hours devoted to forest area restoration.</p> | <p>Mark Mead, mark.mead@seattle.gov, 206 684 4113</p> |
| <p>City of Bellevue, WA, Natural Resource Division</p> | | <p>City of Bellevue, WA, Natural Resource Division, PO Box 90012, Bellevue, WA 98009 - Dan DeWald, ddewald@bellevuewa.gov, 425-452-6048</p> |
| <p>The City of Olympia</p> | <p>Both the urban forestry program and the water resources programs would be well suited as partners in research.</p> | <p>Joe Roush, jroush@ci.olympia.wa.us (360)753-8046, www.ci.olympia.wa.us</p> |
| <p>City of Renton Parks Division</p> | | <p>Terry Flatley, tflatley@ci.renton.wa.us, 425-766-6187</p> |
| <p>WA State Department of Natural Resources, Urban and Community Forestry Program</p> | <p>Other possibilities? City of Olympia, City of Vancouver, Alaska DNR, Mid-Columbia Forestry Council, Oregon Community Trees, Oregon Dept. of Forestry, WSU Extension?</p> | |

**OR Dept Forestry
Urban and
Community Forestry
Program**

Paul Ries, or Kristin Ramstad, 503-945-7391, or 503-945-7390; pries@odf.state.or.us or kramstad@odf.state.or.us

**Washington State
Dept. of
Transportation**

WSDOT has and would like to partner with others on urban forestry issues. We are particularly interested in how to get trees established in harsh site conditions, the economic and environmental benefits of trees, and safety issues as it relates to traffic calming, shading, etc.

Sandy Salisbury, salisbs@wsdot.wa.gov 360-705-7245; Mark Maurer, maurerm@wsdot.wa.gov, 360-705-7242

Puget Sound Energy

Also think WSU Extension in Puyallup could be the local leader in this area.

Tina Melton, tina.melton@pse.com, 253-395-6937

| Science, Education & Outreach | Comment | Contact Info |
|---|---|---|
| <p>College of Forest Resources & Center for Urban Horticulture, University of Washington</p> | <p>Research and teaching about forests at the U of WA spans the landscape gradient from the downtown core, to suburbs, rural areas and wildlands. Collaboration on projects could range from biophysical to human dimensions, including ecological restoration and social benefits.</p> | <p>Kathleen Wolf, Research Social Scientist, 206-780-3619, kwolf@u.washington.edu; www.cfr.washington.edu/research.envmind/</p> |
| <p>College of Forestry, Oregon State University</p> | | <p>College of Forestry, Oregon State University, 109E Richardson Hall, Corvallis, OR. 97331 (541)737-8954, jim.johnson@oregonstate.edu, http://www.cof.orst.edu</p> |
| <p>Center for Spatial Analysis and Research (CSAR) - formerly</p> | | <p>(1) Joe Poracsky, poracskj@pdx.edu, 503/725-3158, http://web.pdx.edu/%7Eporacskj/</p> |
| <p>Cartographic Center, Portland State University</p> | | <p>(2) David Banis, dbanis@pdx.edu, 503/725-8903, http://web.pdx.edu/~dbanis/</p> |
| <p>WSU Master Gardeners</p> | | <p>Linda Chalker-Scott, Associate Professor and Extension Urban Horticulturist, WSU Puyallup Research and Extension Center, 7612 Pioneer Way E, Puyallup, WA 98371, Phone: (253) 445-4542, www.puyallup.wsu.edu/~Linda%20Chalker-Scott/</p> |
| <p>University of Alaska Fairbanks, Cooperative Extension Service</p> | | <p>Corlene Rose, IPM Program Manager, ancor@uaa.alaska.edu, 907-786-6316, http://www.alaska.edu/uaf/ces/</p> |

THIS PAGE INTENTIONALLY LEFT BLANK